Claims

1. Method for determining signal degradations for an optical signal (S) transmitted in a transmission system, by which at least a fraction of the optical signal (S) is fed to an adaptive optical filter (F) at a measurement point in the transmission system, and is then measured in accordance with one or more quality parameters,
characterized in that
a first measurement M0 of the quality parameter(s) is made with the adaptive optical filter (F) being set to pass all signals or being by-passed,
further measurements (M1, M2, ...) are made on the quality parameter(s) with the adaptive optical filter (F) having predefined pass characteristics, each of which has an influence on the signal distortions.

2. Method in accordance with Claim 1,
characterized in that
the pass characteristics of the adaptive optical filter (F) by which one or more signal distortions are influenced or compensated, as applicable, are reset before, between or after the measurements (M1, M2, ...) which are made.

3. Method in accordance with one of the preceding claims,
characterized in that
in the case of a broadband optical multiplex signal (S), a spectrally-adjustable fraction of the optical multiplex signal (S) is fed to the adaptive optical filter (F).

4. Method in accordance with one of the preceding claims,
characterized in that
at least one quality parameter is measured for a statement about the residual dispersion and about other signal distort-

ions in the filtered signal, and from this compensation is effected by an adjustment of the adaptive optical filter (F).

5. Method in accordance with one of the preceding claims, characterized in that
the quality parameter(s) are effected by a measurement on eye-diagrams, amplitude histograms, Q measurements or by a measurement of errors in the signal, supplied from the adaptive optical filter (F) and then opto-electrically converted, which have been corrected by FEC or EFEC.

6. Method in accordance with one of the Claims 1 to 4, characterized in that
one or more quality parameters are measured for a statement about noise-like interference in the filtered signal.

7. Method in accordance with one of the Claims 1 to 6, characterized in that
one or more quality parameters provide statements about polarization effects.

8. Method in accordance with one of the preceding claims, characterized in that
for the adaptive optical filter (F), use is made of a single- or multi-stage FIR or an IIR filter for which the amplitude or phase response of the optical signal (S) can be regulated.

9. Method in accordance with one of the preceding claims, characterized in that
the pass characteristics of the adaptive optical filter (F) are regulated on the basis of an analysis of one or more of the quality parameters which have been determined.

10. Method in accordance with one of the preceding claims,

characterized in that
the pass characteristics of the adaptive optical filter (F) are determined from computer simulations.

11. Method in accordance with one of the preceding claims, characterized in that
by using a predefined variation in the pass characteristics of the adaptive optical filter, an analysis is carried out of the signal quality, in relation to various effects which can influence the signal.

12. Method in accordance with one of the preceding claims, characterized in that
by using a predefined variation in the pass characteristics of the adaptive optical filter, the various effects which can influence the signal are separated out.

13. Method in accordance with one of the preceding claims, characterized in that
the signal is optimized in relation to one or more quality parameters by means of suitable adjustment parameters of the adaptive optical filter (F), and from these adjustment parameters conclusions are drawn about the signal degradations.

14. Method in accordance with one of the preceding claims, characterized in that
a table, for use in registering the effects which can influence the signal against the corresponding settings of the pass characteristics of the adaptive optical filter (F), is created when the pass characteristics are reset.

15. Method in accordance with one of the preceding claims, characterized in that
when a change is detected in the signal quality, the table

which has been created is updated.

16. Method in accordance with one of the preceding claims, characterized in that the main effects or groups of effects anticipated as having an influence on the signal are dispersion, distortions, noise-like effects and polarization effects.

17. Method in accordance with one of the preceding claims, characterized in that several interconnected adaptive optical filters F are used.

18. Arrangement for the determination of signal degradations in an optical broadband signal (S), transmitted via a transmission system, from which at least a fraction (S1) in spectral and/or amplitude terms is tapped off by means of a coupler (KO) and fed to an adaptive optical filter (F), that connected downstream from the adaptive optical filter (F) are a measurement unit (ME) and a determination unit (EE) for determining one or more quality parameters, characterized in that that connected to the adaptive optical filter (F) is a control unit (SE) for the purpose at least of switching through and/or to exercise an influence on signal distortions in the optical signal (S) by the settings of predefined pass characteristics for the adaptive optical filter (F).

19. Arrangement in accordance with Claim 18, characterized in that a bandpass filter (BPF0) is connected downstream from the coupler (KO).

20. Arrangement in accordance with Claim 19, characterized in that

connected downstream from the bandpass filter (BPF0) is an amplifier (V1), with a further bandpass filter (BPF1) connected downstream from it.

21. Arrangement in accordance with Claim 20, characterized in that an amplifier (V0) is connected between the coupler (KO) and the bandpass filter (BPF0).

22. Arrangement for measuring signal degradations for an optical broadband signal (S) transmitted over a transmission system, from which at least a fraction (S1) in amplitude terms is tapped off by means of a coupler (KO) and is fed to an adaptive optical filter (F), characterized in that, inserted into the circuit between the coupler (KO) and the adaptive optical filter (F) are a first circulator (C1), in addition a bandpass filter (BPF0), and then a second circulator (C2), connected to the output of the adaptive optical filter (F) there is an optical signal feedback (FB) for the purpose of transmitting the filtered signal (S2) to the second circulator (C2), the filtered signal (S2) is supplied to a signal quality measurement unit (ME) via the circulator (C2), the bandpass filter (BPF0) and the first circulator (C1), and connected to the adaptive optical filter (F) is a control unit (SE) for the purpose at least of switching through and/or exercising an influence on signal distortions in the optical signal (S).

23. Arrangement in accordance with Claim 22, characterized in that connected between the bandpass filter (BPF0) and the second

circulator (C2) is an amplifier (V1), or
an amplifier (V1) is arranged in the optical signal feedback (FB).

24. Arrangement in accordance with Claim 23,
characterized in that
connected between the coupler (KO) and the first circulator (C1) is an amplifier (V0).

25. Arrangement in accordance with one of the preceding Claims 18 to 24,
characterized in that
a unit (EE) for the determination of one or more quality parameters is connected to the measurement unit (ME).

26. Arrangement in accordance with one of the preceding Claims 18 to 25,
characterized in that
connected between the determination unit (EE) and the control unit (SE) is a bidirectional communication facility (KM).

27. Arrangement in accordance with one of the preceding Claims 18 to 26,
characterized in that
connected to the determination unit (EE) is a module for analyzing and/or separating signal degradations.

28. Arrangement in accordance with one of the preceding Claims 18 to 27,
characterized in that
connected upstream from the measurement unit (ME) is an opto-electrical converter (OEW).

29. Arrangement in accordance with one of the preceding Claims

18 to 28, characterized in that the adaptive optical filter (F) has a module by which the phase and/or amplitude response of the optical signal can be influenced, and which is controlled by means of the control unit (SE).

30. Arrangement in accordance with one of the preceding Claims 18 to 29, characterized in that the optical signal (S) is a multiplex signal with several optical channels, and the bandpass filters (BPF0, BPF1) or (BPF0), as applicable, are adjustable channel selection filters.

31. Method for determining signal degradations for an optical signal (S) transmitted in a transmission system, by which at least a fraction of the optical signal (S) is fed to an adjustable equalizer (EQ) at a point in the transmission system, whereby several adjustment parameters are set for equalization purposes, characterized in that a first series of adjustment parameters is set, for the purpose of a further adjustment of the equalizer (EQ), at least one further different series of adjustment parameters is set, an analysis is performed of the different series of adjustment parameters which were set, in conjunction with the signal quality of the resulting equalized signal, and from the analysis at least one signal degradation is determined for the signal which is to be equalized.

32. Method in accordance with Claim 31, characterized in that the optical signal (S) is subject to an opto-electrical

conversion and is electrically equalized, preferably using an IIR or FIR filter or a compensator for one or more signal degradations.

33. Method in accordance with Claim 31, characterized in that the equalization is effected optically, preferably using an IIR or FIR filter or a compensator for one or more signal degradations.

34. Method in accordance with one of the preceding Claims 31 to 33, characterized in that the series of adjustment parameters are chosen in a predefined way and are then analyzed together with the resulting signal qualities.

35. Method in accordance with one of the preceding Claims 31 to 33, characterized in that for the equalization, the series of adjustment parameters are chosen for optimization of the signal quality.

36. Method in accordance with one of the preceding Claims 31 to 35, characterized in that the series of adjustment parameters are chosen according to known causes of signal degradations.

37. Method in accordance with one of the preceding Claims 31 to 36, characterized in that the series of adjustment parameters are tabulated and are assigned to one or more types and strengths of signal

degradation.

38. Method in accordance with Claim 37, characterized in that further signal degradations are determined from interpolation of the signal degradations assigned to the series of adjustment parameters.

39. Method in accordance with one of the preceding Claims 31 to 38, characterized in that one or more optical equalizers or adaptive filters are used, some connected in series and/or some in parallel with one or more electrical equalizers or adaptive filters.